



The opening of central segment of the South Atlantic: symmetry and the extension discrepancy

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The rifted margins of the central segment of the South Atlantic are considered in terms of magmatism, symmetry and the amount and timing of extension, in comparison to the margins of the North Atlantic. I set out to explain the apparent lack of significant faulting in the pre-salt “sag basins” observed on these margins and the inferred transition from terrestrial to lacustrine to evaporitic to open marine sedimentation. It is suggested that the South Atlantic margins are probably moderately magmatic, with most of the magmatism occurring in the Hauterivian-Barremian, after the onset of rifting in the Berriasian. Most of the crustal extension also took place between the Berriasian and Hauterivian, before focusing along a narrow line of breakup in the Aptian that cut obliquely across the earlier rift structures. The changing locus of the rifting with time led to the development of considerable asymmetry, and the stranding of the large part of the salt basins on variously the African and South American margin. The amount of Berriasian-Hauterivian extension may have been underestimated and may be sufficient to explain the majority of the observed crustal thinning. An apparent subsidence deficit by the time of the deposition of the Aptian evaporites is a likely consequence of either delayed thermal subsidence due to the influx of hot asthenosphere or the effect of a local water level in the isolated early Cretaceous basin well below global sealevel throughout both lacustrine and evaporitic deposition. No erosional unconformity resulting from drawdown is observed as no drawdown occurred: the basin developed with the subdued topography of a subaerial rift before being gradually invaded by seawater during the Aptian (leading to the evaporite sequences), with the transgression leading to open marine conditions in the Albian.